WHAT IS CLAIMED IS:

1. A bit interleaving method comprising the steps of:

grouping the coded bits of an OFDM symbol stream into blocks of XN_{CBPS}, wherein X is a desired number of OFDM symbols and further wherein N_{CBPS} is the number of coded bits per symbol;

permuting each group of coded bits and generating interleaved OFDM symbols in response thereto only if the coded bits available for grouping correspond to no less than X OFDM symbols;

grouping the interleaved OFDM symbols into blocks of N_{CBPS} bits; and

permuting each block of N_{CBPS} bits associated with the interleaved OFDM symbols and generating interleaved OFDM tones in response thereto.

2. The bit interleaving method according to claim 1, wherein X = 6.

3. The bit interleaving method according to claim 1, wherein the step of permuting each group of coded bits and generating interleaved OFDM symbols in response thereto is implemented via a symbol interleaving operation having an input-output relationship defined by $S(j) = U\left\{Floor\left(\frac{i}{N_{CBPS}}\right) + XMod(i, N_{CBPS})\right\}$, wherein $\{U(i)\}$ and $\{S(j)\}$, where $i, j = 0,\ldots,XN_{CBPS}$, represent the input and output bits of the symbol interleaving operation respectively, and further wherein the function $Floor(\cdot)$ returns the largest integer value less than or equal to its argument value, and further wherein the function $Mod(\cdot)$ returns the remainder after division of N_{CBPS} by i.

4. The bit interleaving method according to claim 3, wherein X = 6.

5. The bit interleaving method according to claim 1, wherein the step of permuting each block of N_{CBPS} bits associated with the interleaved OFDM symbols and generating interleaved OFDM tones in response thereto comprises permuting each block of N_{CBPS} bits via a tone interleaving operation of size $N_{Tint} \times A$, wherein $N_{Tint} = N_{CBPS}/A$, and further wherein A is a desired integer value.

6. The bit interleaving method according to claim 5, wherein A = 10.

7. The bit interleaving method according to claim 5, wherein A = 10 and X = 6.

8. The bit interleaving method according to claim 5, wherein the tone interleaving operation has an input-output relationship defined by

$T(j) = S\left\{Floor\left(\frac{i}{N_{T\,\mathrm{int}}}\right) + AMod(i, N_{T\,\mathrm{int}})\right\}$, wherein $\{S(i)\}$ and $\{T(j)\}$, where i, j =0,...,$N_{CBPS} - 1$ represent the input and output bits of the tone interleaving operation respectively, and further wherein the function *Floor*(·) returns the largest integer value no greater than it argument value, and further wherein the function *Mod*(·) returns the remainder after division of N_{Tint} by i.

9. The bit interleaving method according to claim 8, wherein A = 10.

10. The bit interleaving method according to claim 8, wherein A = 10 and X = 6.

11. The bit interleaving method according to claim 1, wherein the steps of generating interleaved OFDM symbols and generating interleaved OFDM tones are implemented via a single stage composite interleaving operation.

12. A bit interleaving method comprising the steps of:

grouping the coded bits of an OFDM symbol stream into blocks of XN_{CBPS}, wherein X is a desired number of OFDM symbols and further wherein N_{CBPS} is the number of coded bits per symbol, and further wherein pad bits are added to increase the number of bits to correspond to XN_{CBPS}, whenever the number of coded bits per symbol is less than N_{CBPS};

permuting each group of coded bits and generating interleaved OFDM symbols in response thereto;

grouping the interleaved OFDM symbols into blocks of N_{CBPS} bits; and

permuting each block of N_{CBPS} bits associated with the interleaved OFDM symbols and generating interleaved OFDM tones in response thereto.

13. The bit interleaving method according to claim 12, wherein X = 6.

14. The bit interleaving method according to claim 12, wherein the step of permuting each group of coded bits and generating interleaved OFDM symbols in response thereto is implemented via a symbol interleaving operation having an input-output relationship defined by $S(j) = U\left\{Floor\left(\frac{i}{N_{CBPS}}\right) + XMod(i, N_{CBPS})\right\}$, wherein $\{U(i)\}$ and $\{S(j)\}$, where $i, j = 0,\ldots,XN_{CBPS}$, represent the input and output bits of the symbol interleaving operation respectively, and further wherein the function *Floor*(·) returns the largest integer value less than or equal to its argument value, and further wherein the function *Mod*(·) returns the remainder after division of N_{CBPS} by *i*.

15. The bit interleaving method according to claim 14, wherein X = 6.

16. The bit interleaving method according to claim 12, wherein the step of permuting each block of N_{CBPS} bits associated with the interleaved OFDM symbols and generating interleaved OFDM tones in response thereto comprises permuting each block of N_{CBPS} bits via a tone interleaving operation of size $N_{Tint} \times A$, wherein $N_{Tint} = N_{CBPS}/A$, and further wherein A is a desired integer value.

17. The bit interleaving method according to claim 16, wherein A = 10.

18. The bit interleaving method according to claim 16, wherein A = 10 and X = 6.

19. The bit interleaving method according to claim 16, wherein the tone interleaving operation has an input-output relationship defined by

$T(j) = S\left\{Floor\left(\frac{i}{N_{T\,\mathrm{int}}}\right) + AMod\left(i, N_{T\,\mathrm{int}}\right)\right\}$, wherein $\{S(i)\}$ and $\{T(j)\}$, where i, j =0,...,N_{CBPS} – 1 represent the input and output bits of the tone interleaving operation respectively, and further wherein the function *Floor*(·) returns the largest integer value no greater than it argument value, and further wherein the function *Mod*(·) returns the remainder after division of N_{Tint} by i.

20. The bit interleaving method according to claim 19, wherein A = 10.

21. The bit interleaving method according to claim 19, wherein X = 6.

22. The bit interleaving method according to claim 19, wherein A = 10 and X = 6.

23. The bit interleaving method according to claim 12, wherein the steps of generating interleaved OFDM symbols and generating interleaved OFDM tones are implemented via a single stage composite interleaving operation.

24. A bit interleaver comprising:

A symbol interleaver operational to group the coded bits of a an OFDM symbol stream into blocks of XN_{CBPS} coded bits, wherein X is the desired number of OFDM symbols and further wherein N_{CBPS} is the number of coded bits per symbol, and further operational to permute each group of coded bits and generate interleaved OFDM symbols in response thereto only if the coded bits available for grouping correspond to no less than X OFDM symbols; and

A tone interleaver operational to group the interleaved OFDM symbols into blocks of N_{CBPS} bits and permute each block of N_{CBPS} bits associated with the interleaved OFDM symbols and generate interleaved OFDM tones in response thereto.

25. The bit interleaver according to claim 24, wherein X = 6.

26. The bit interleaver according to claim 24, wherein the symbol interleaver is configured to have an input-output relationship defined by $S(j) = U\left\{Floor\left(\frac{i}{N_{CBPS}}\right) + XMod(i, N_{CBPS})\right\}$, wherein $\{U(i)\}$ and $\{S(j)\}$, where $i, j =$ $0,\ldots,XN_{CBPS}$, represent the input and output bits of the symbol interleaver respectively, and further wherein the function *Floor*(·) returns the largest integer value less than or equal to its argument value, and further wherein the function *Mod*(·) returns the remainder after division of N_{CBPS} by *i*.

27. The bit interleaver according to claim 26, wherein X = 6.

28. The bit interleaver according to claim 24, wherein the tone interleaver is configured to have an input-output relationship defined by $T(j) = S\left\{ Floor\left(\frac{i}{N_{T\,\mathrm{int}}} \right) + AMod\left(i, N_{T\,\mathrm{int}}\right) \right\}$, wherein $\{S(i)\}$ and $\{T(j)\}$, where i, j $=0,\ldots,N_{CBPS} - 1$ represent the input and output bits of the tone interleaver respectively, and further wherein the tone interleaver size = $N_{Tint} \times A$, $N_{Tint} = N_{CBPS}/A$ and A is a desired integer value, and further wherein the function *Floor*(·) returns the largest integer value no greater than it argument value, and further wherein the function *Mod*(·) returns the remainder after division of N_{Tint} by i.

29. The bit interleaver according to claim 28, wherein A = 10.

30. The bit interleaver according to claim 28, wherein X = 6.

31. The bit interleaver according to claim 28, wherein A = 10 and X = 6.

32. A composite bit interleaver operational to group the coded bits of an OFDM symbol stream into blocks of XN_{CBPS} coded bits, wherein X is the desired number of OFDM symbols and further wherein N_{CBPS} is the number of coded bits per symbol, and further operational to permute each group of coded bits and generate interleaved OFDM symbols in response thereto only if the coded bits available for grouping correspond to no less than X OFDM symbols; and further operational to group the interleaved OFDM symbols into blocks of N_{CBPS} bits and permute each block of N_{CBPS} bits associated with the interleaved OFDM symbols and generate interleaved OFDM tones in response thereto.

33. The composite bit interleaver according to claim 32, wherein X = 6.

34. The composite bit interleaver according to claim 32, wherein the symbol interleaving operation is defined via an input-output relationship according to $S(j) = U\left\{Floor\left(\frac{i}{N_{CBPS}}\right) + XMod(i, N_{CBPS})\right\}$, wherein $\{U(i)\}$ and $\{S(j)\}$, where i, j = 0,...,XN_{CBPS}, represent the input and output bits of the symbol interleaving operation respectively, and further wherein the function *Floor*(·) returns the largest integer value less than or equal to its argument value, and further wherein the function *Mod*(·) returns the remainder after division of N_{CBPS} by *i*.

35. The composite bit interleaver according to claim 34, wherein X = 6.

36. The composite bit interleaver according to claim 32, wherein the tone interleaving operation is defined via an input-output relationship according to $T(j) = S\left\{Floor\left(\frac{i}{N_{T\,\mathrm{int}}}\right) + AMod(i, N_{T\,\mathrm{int}})\right\}$, wherein $\{S(i)\}$ and $\{T(j)\}$, where i, j =0,...,$N_{CBPS} - 1$ represent the input and output bits of the tone interleaving operation respectively, and further wherein the tone interleaver size = $N_{Tint} \times A$, $N_{Tint} = N_{CBPS}/A$ and A is a desired integer value, and further wherein the function *Floor*(·) returns the largest integer value no greater than it argument value, and further wherein the function *Mod*(·) returns the remainder after division of N_{Tint} by i.

37. The composite bit interleaver according to claim 36, wherein A = 10.

38. The composite bit interleaver according to claim 36, wherein X = 6.

39. The composite bit interleaver according to claim 36, wherein A = 10 and X=6.

40. A composite bit interleaver operational to group the coded bits of an OFDM symbol stream into blocks of XN_{CBPS} coded bits, wherein X is the desired number of OFDM symbols, N_{CBPS} is the number of coded bits per symbol, and pad bits are used to increase the number of bits to correspond to X OFDM symbols whenever the number of coded bits per symbol is less than N_{CBPS}, and to permute each group of coded bits and generate interleaved OFDM symbols in response thereto; and further operational to group the interleaved OFDM symbols into blocks of N_{CBPS} bits and permute each block of N_{CBPS} bits associated with the interleaved OFDM symbols and generate interleaved OFDM tones in response thereto.

41. The composite bit interleaver according to claim 40, wherein X = 6.

42. The composite bit interleaver according to claim 40, wherein the symbol interleaving operation is defined via an input-output relationship according to $S(j) = U\left\{Floor\left(\frac{i}{N_{CBPS}}\right) + XMod(i, N_{CBPS})\right\}$, wherein $\{U(i)\}$ and $\{S(j)\}$, where $i, j =$ $0,\ldots,XN_{CBPS}$, represent the input and output bits of the symbol interleaving operation respectively, and further wherein the function *Floor*(·) returns the largest integer value less than or equal to its argument value, and further wherein the function *Mod*(·) returns the remainder after division of N_{CBPS} by *i*.

43. The composite bit interleaver according to claim 42, wherein X = 6.

44. The composite bit interleaver according to claim 40, wherein the tone interleaving operation is defined via an input-output relationship according to

$$T(j) = S\left\{Floor\left(\frac{i}{N_{T\,\mathrm{int}}}\right) + AMod\left(i, N_{T\,\mathrm{int}}\right)\right\}$$, wherein $\{S(i)\}$ and $\{T(j)\}$, where i, j $=0,\ldots,N_{CBPS} - 1$ represent the input and output bits of the tone interleaving operation respectively, and further wherein the tone interleaver size = $N_{Tint} \times A$, $N_{Tint} = N_{CBPS}/A$ and A is a desired integer value, and further wherein the function *Floor*(·) returns the largest integer value no greater than it argument value, and further wherein the function *Mod*(·) returns the remainder after division of N_{Tint} by i.

45. The composite bit interleaver according to claim 44, wherein A = 10.

46. The composite bit interleaver according to claim 44, wherein X = 6.

47. The composite bit interleaver according to claim 44, wherein A = 10 and X=6.

48. A bit interleaving method comprising the steps of:

permuting coded bits of an OFDM symbol stream and generating interleaved OFDM symbols in response thereto; and

permuting each group of bits associated with each interleaved OFDM symbol and generating interleaved OFDM tones within each OFDM symbol in response thereto.

49. The bit interleaving method according to claim 48, wherein the step of generating interleaved OFDM symbols comprises interleaving OFDM symbols via an interleaver selected from the group consisting of a regular block interleaver, a random interleaver, a random block interleaver, a triangular interleaver, and a composite symbol/tone interleaver.

50. The bit interleaving method according to claim 48, wherein the step of generating interleaved OFDM tones comprises interleaving OFDM tones within each OFDM symbol via an interleaver selected from the group consisting of a regular block interleaver, a random interleaver, a random block interleaver, a triangular interleaver, and a composite symbol/tone interleaver.

51. The bit interleaving method according to claim 48, wherein the step of generating interleaved OFDM symbols comprises adding pad bits to the OFDM symbol stream sufficient to allow generating a desired number of OFDM symbols whenever the number of incoming OFDM symbol bits is insufficient to accommodate generating the desired number of OFDM symbols.

52. A bit interleaving method comprising the steps of:

permuting coded bits of an OFDM symbol stream and generating interleaved OFDM symbols to implement a desired interleaved OFDM symbol pattern in response thereto; and

permuting each group of bits associated with each interleaved OFDM symbol and generating interleaved OFDM tones within each OFDM symbol in response to the desired interleaved OFDM symbol pattern.

53. The bit interleaving method according to claim 52, wherein the step of permuting each group of bits associated with each interleaved OFDM symbol and generating interleaved OFDM tones within each OFDM symbol in response to the desired interleaved OFDM symbol pattern is achieved via a plurality of different types of symbol/tone interleaving operations, wherein each type of symbol/tone interleaving operation is determined via the desired interleaved OFDM symbol pattern.